

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application. Cancel claims 1 and 4-10. Amend claims 21 and 24 to read as follows:

**Listing of Claims:**

1-20 (canceled)

21 (currently amended). A method for functionalizing a collection of carbon nanotubes (CNTs), the method comprising:

irradiating a precursor gas at a selected production location to provide a plurality of particles of a selected charged particle target species in a first chamber having a first selected chamber pressure  $p_1$ , and to provide a preferred initial velocity for at least one particle of the selected charged particle target species, where at least one charged non-target species particle is also present in the first chamber;

providing a collection of CNTs on a substrate in a second chamber having a second selected sub-Torr pressure  $p_2$ , where  $p_2$  lies in a range of about  $0.002 \cdot p_1 - 0.01 \cdot p_1$ ;

providing a particle communication mechanism, having a particle aperture entrance that is spaced apart from the production location by a selected distance, that allows transport of at least a portion of the particles from the first chamber to the second chamber;

configuring ~~said~~ the particle communication mechanism so that transport of ultraviolet radiation from said first chamber to said second chamber is suppressed;

providing a substantially constant vector magnetic field **B** in the first chamber, where the magnitude and direction of the magnetic field **B** are chosen so that (i) a trajectory in the field **B** of at least one particle of the selected charged particle target species produced at the production location will pass substantially through the aperture entrance and (ii) a trajectory in the field **B** for at least one charged non-target species particle produced at the production location will be no closer than a positive threshold distance from the aperture entrance,

whereby at least one particle of the selected charged particle target species becomes chemically attached to at least one of the CNTs in the second chamber, and a density of the at least one non-target species adjacent to the aperture entrance is reduced relative to a density of the selected charged particle target species adjacent to the aperture entrance.

22 (previously presented). The method of claim 21, further comprising:

at a first selected time, providing a first vector value **B1** of said magnetic field **B** for which said corresponding trajectory in the magnetic field **B1** of said first selected charged particle target species is preferentially delivered to said particle aperture entrance; and

at a second selected time that is later than the first selected time, providing a second vector value **B2** of said magnetic field **B** for which said corresponding trajectory in the magnetic field **B2** of a second selected charged particle target species is preferentially delivered to said particle aperture entrance, where the magnitude of the field **B1** differs from the magnitude of the field **B2**.

23 (canceled).

24 (currently amended). The method of claim 21, wherein said transport of ~~said~~ ultraviolet radiation from said first chamber to said second

chamber is suppressed by providing an elongated aperture, having an aperture central axis and an aperture side wall and connecting said first and second chambers, further comprising arranging the aperture according to at least one of the following: (i) the aperture central axis is aligned off-axis so that little or no ultraviolet radiation that is produced within said first chamber can move in a single straight line from said first chamber to said second chamber, (ii) the aperture central axis is curvilinear, and is provided with sufficient curvature so that substantially no ultraviolet radiation that is produced within said first chamber can move in a single straight line from said first chamber to said second chamber, ~~and~~ (iii) the aperture central axis has at least one bend point at which a direction of the central axis changes abruptly so that substantially no ultraviolet radiation that is produced within said first chamber can move in a single straight line from said first chamber to said second chamber, ~~and~~ (iv) at least a portion of the aperture side wall is provided with a chemical substance (iv-a) that absorbs the ultraviolet radiation and emits no radiation in response thereto or (iv-b) that absorbs the ultraviolet radiation and, in response thereto, emits radiation having an emitted energy that is lower than required to cause a bond breakage in at least one of a C-C bond and a C-H bond.

25 (original). The method of claim 24, further comprising providing at least a portion of said aperture side wall with a chemical substance (i) that absorbs said ultraviolet radiation and emits no radiation in response thereto or (ii) that absorbs said ultraviolet radiation and, in response thereto, emits radiation having an emitted energy that is lower than required to cause a bond breakage in at least one of a carbon-carbon bond and a carbon-hydrogen bond.

26 (previously presented). The method of claim 21, further comprising choosing said selected charged particle target species from a group of target particle species having a non-zero electrical charge and

consisting of H, Li, Na, K, Rb, Cs, F, Cl, Br, I, dichlorocarbene,  $C_nH_{2n}$ ,  $C_nH_{2n+1}$  and  $C_nH_{2n+2}$ , with n = 1, 2 and 3.

27 (original). The method of claim 21, wherein said step of irradiating said precursor gas comprises irradiating said precursor gas with at least one of a dc source, a radiofrequency source, a microwave source and an induction source of radiation to provide a cold plasma.

28 (original). The method of claim 21, further comprising choosing said pressure p1 in a range  $100 \mu\text{m Hg} \leq p1 \leq 1000 \mu\text{m Hg}$ .

29 (original). The method of claim 21, further comprising choosing said pressure p2 in a range  $1 \mu\text{m Hg} \leq p2 \leq 10 \mu\text{m Hg}$ .

30 (previously presented). The method of claim 21, further comprising allowing at least one particle of said selected charged particle target species to become chemically attached to at least one of said CNTs in said second chamber in an exposure time interval no longer than about 30 sec.

31 (previously presented). The method of claim 21, further comprising allowing at least one particle of said selected charged particle target species to become chemically attached to said at least one CNT at a temperature in said second chamber that is no greater than about room temperature.

32-42 (canceled).